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ABSTRACT

This packet contains a program guide and Career Merit Achievement Plan (Career MAP) for the implementation of a computer programming curriculum in Florida secondary and postsecondary schools. The program guide describes the program content and structure, provides a program description, lists job titles under the program, and includes a curriculum framework and student performance standards for computer programing courses. The curriculum framework outlines major concepts and content, laboratory activities, program specifics, and intended outcomes; the student performance standards guide lists each standard and the behaviors expected to show mastery of each standard. The guide also provides information on the following: facilities, equipment, and supplies, and safety for computer programing classrooms and laboratories; program implementation; teacher professional development, teacher certification, professional organizations and support services; and instructional resources (a listing of sources for print materials, audiovisuals, and computer software programs; and a list of 49 teacher-recommended print materials, 1 teacher-recommended audiovisual, and 7 teacher-recommended software programs). Appended to the program guide is a sample student learning guide that includes program title, intended outcome, learning activities with resources, procedures, information sheets, and self-check with answers. The Career MAP is a checklist, to be kept by student and teacher, of student progress in the competencies required for entry into jobs in the computer programing field. (KC)

ED358345

FLORIDA VOCATIONAL PROGRAM GUIDE FOR

COMPUTER PROGRAMMING

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Office of Educational Research and Improvement
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Betty Castor, Commissioner

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Florida State University

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FLORIDA VOCATIONAL PROGRAM GUIDE FOR

COMPUTER PROGRAMMING

State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

Division of Vocational, Adult, and Community Education
Bureau of Vocational Program and Staff Development

June 1990

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INTRODUCTION

The *Florida Vocational Program Guide for Computer Programming* has been developed to provide information that will be useful to local administrators, regional coordinating councils, teachers, and others charged with the responsibility of offering vocational education training in Business Education in school districts, area vocational centers, and community colleges. The final planning, implementation, and evaluation of any educational program, however, must be done within the context of local conditions and local needs.

Many of the elements involved in the creation and maintenance of a vocational education program are generic to all subject areas; these issues are addressed in detail in the *Florida Vocational Program Implementation Guide (FVPIG)*, **which should be considered an essential companion piece to this document.** The *FVPIG* contains information on the following:

- the importance of, as well as development strategies for, student learning guides
- information addressing concerns about program planning and implementation
- teacher requirements, updating, and certification
- program-evaluation requirements
- in-depth program-component description

This *Florida Vocational Program Guide for Computer Programming* will serve to identify particular considerations in the organization, operation, and evaluation of this specific vocational education program.

This program guide helps ensure equivalency. Computer Programming programs, if implemented throughout Florida according to the criteria described in this document, will help many citizens fill an important place in our state and national work force.

PROGRAM CONTENT AND STRUCTURE

The content of the Computer Programming program is based on occupational competencies and employability skills required for entry into the business programming occupations. The basic content of this program is described in the Florida Curriculum Framework and Student Performance Standards (SPSs).

The Computer Programming program includes both classroom and practical learning experiences that provide students with career information and job requirements for business programmers and data control clerks. This program provides students with an initial exposure to the skills and attitudes associated with careers in related mathematics occupations. The basic skills and attitudes related to these occupations are indicated as intended outcomes in the Curriculum Framework of this guide.

Job Title and Description

Job Title: Business Programmer

Description: A business programmer constructs and maintains data processing programs and operates computers, peripheral, and data entry equipment; converts data into detailed logical flowcharts for coding into computer language; observes or operates computer to test coded programs, corrects program errors by such methods as altering program steps and sequence; analyzes, reviews, and rewrites programs to increase efficiency or adapt to new requirements. A business programmer may also specialize in writing programs for one make and type of computer.

Curriculum Framework and Student Performance Standards

Program objectives and content should be consistent with the Vocational Education Program Course Standards as approved by the Florida State Board of Education. Provided on the following pages are the Curriculum Framework and Student Performance Standards for Computer Programming courses as listed in the official *Vocational Education Program Courses Standards* document. Since these SPSs are continually updated, you should check with your district's business education supervisor and the regional program specialist for a current version every year.

CURRICULUM FRAMEWORK

PROGRAM AREA: Business

FLORIDA DEPARTMENT OF EDUCATION

EFFECTIVE DATE: July, 1990

PROGRAM TITLE: Computer Programming

CODE NUMBER: Secondary 8206000 Postsecondary CGS0990

Florida CIP 0507.030000

SECONDARY SCHOOL CREDITS	COLLEGE CREDITS	POSTSECONDARY ADULT VOCATIONAL CREDITS
4		X

APPLICABLE LEVEL(S): __7-9 ___9-12 __Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 10-12; 30, 31

CERTIFICATION COVERAGE:	10-12; 30, 31	BUS ED @4 1 2 TEACH CBE @7 TEC ELEC @7 BOOKKEEPING @4 @7	VOC @7 BUS DP @7 ELECT DP @7
	30, 31	BUS ED @4 1 2 TEACH CBE @7 TEC ELEC @7 BOOKKEEPING @4 @7	VOC @7 BUS DP 7 ELECT DP @7

I. **Major Concepts/Content.** The purpose of this program is to prepare students for employment as business programmers (020.162-014) and data control clerks, or to provide supplemental training for persons previously or currently employed in these occupations.

The content prepares individuals to monitor and maintain data processing programs and operate computers, peripheral, and data entry equipment.

Listed below are the courses that comprise this program when offered at the secondary level.

8209010 Typewriting 1/Fundamentals
8206110 Business Computer Applications 1
8206010 Business Computer Programming 1
8206020 Business Computer Programming 2

II. **Laboratory Activities.** Laboratory activities are an integral part of this program and include the use of keyboarding/typewriting systems, calculators, computers, and peripheral equipment.

III. **Special Note.** Concepts of American enterprise are included in this program so that students may function effectively in the American enterprise economic system.

Future Business Leaders of America (secondary) and Phi Beta Lambda (postsecondary) are the appropriate vocational student organizations for providing leadership learning experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a workstation that reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for the postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state-designated basic skills examination.

The typical length of this program for the average achieving student is 600 hours.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

IV. **Intended Outcomes.** After successfully completing this program, the student will be able to:

01. Perform telephone activities.
02. Perform math computations.
03. Perform keyboarding/typewriting activities.
04. Perform filing activities.
05. Perform business records activities.
06. Perform mail-handling activities.
07. Perform communication activities.
08. Develop human relations skills.
09. Develop appropriate grooming habits.
10. Perform job application activities.
11. Demonstrate a knowledge of information processing concepts.
12. Develop leadership skills.
13. Perform consumer economics activities.
14. Identify functions of data processing.

15. Perform decision-making activities.
16. Operate data entry equipment.
17. Plan program design.
18. Code programs.
19. Test programs.
20. Perform program maintenance.
21. Evaluate business computer programming tasks.
22. Perform advanced business computer programming techniques.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1990

PROGRAM AREA: Business

SECONDARY NUMBER: 8206000

PROGRAM TITLE: Computer Programming

POSTSECONDARY NUMBER: CGS0990

01.0 PERFORM TELEPHONE ACTIVITIES--The student will be able to:

- 01.01 Identify telephone services and types of calls.
- 01.02 Locate telephone numbers and addresses.

02.0 PERFORM MATH COMPUTATIONS--The student will be able to:

- 02.01 Solve addition, subtraction, multiplication, and division problems manually.
- 02.02 Complete an invoice.
- 02.03 Compute totals and sales tax on a sales slip.
- 02.04 Solve addition, subtraction, multiplication, and division problems using a ten-key calculator or numeric pad.
- 02.05 Compute discounts.

03.0 PERFORM KEYBOARDING/TYPEWRITING ACTIVITIES--The student will be able to:

- 03.01 Demonstrate keyboarding techniques.
- 03.02 Identify operative parts of keyboarding equipment.
- 03.03 Identify formatting principles.
- 03.04 Demonstrate speed and accuracy in typing straight-copy material.
- 03.05 Type business letters and envelopes.
- 03.06 Type interoffice memoranda.
- 03.07 Type tabulated information.
- 03.08 Type different sizes of cards.

04.0 PERFORM FILING ACTIVITIES--The student will be able to:

- 04.01 Index, code, sort, and file materials alphabetically.

05.0 PERFORM BUSINESS RECORDS ACTIVITIES--The student will be able to:

- 05.01 Prepare checks and stubs.
- 05.02 Endorse checks using special endorsement.
- 05.03 Prepare a deposit slip and adjust checkbook.
- 05.04 Prepare bank reconciliations.
- 05.05 Enter data into an accounts payable system.
- 05.06 Enter data into an accounts receivable system.
- 05.07 Enter data into a cash payments system.
- 05.08 Enter data into a cash receipts system.
- 05.09 Enter data into a payroll system.

06.0 PERFORM MAIL-HANDLING ACTIVITIES--The student will be able to:

06.01 Classify mail.
06.02 Locate ZIP codes.

07.0 PERFORM COMMUNICATION ACTIVITIES--The student will be able to:

07.01 Locate and record information retrieved from written resources.
07.02 Spell and define words, including business terminology.
07.03 Follow oral and written instructions.
07.04 Compose and keyboard a letter of application.
07.05 Compose and keyboard a resume.

08.0 DEVELOP HUMAN RELATIONS SKILLS-- The student will be able to:

08.01 Demonstrate appropriate work habits.
08.02 Identify traits that promote good human relations and increase job performance.

09.0 DEVELOP APPROPRIATE GROOMING HABITS--The student will be able to:

09.01 Identify appropriate attire and grooming for a business office.

10.0 PERFORM JOB APPLICATION ACTIVITIES--The student will be able to:

10.01 Complete employment forms.
10.02 Classify behaviors considered to be appropriate or inappropriate in a job interview situation.
10.03 Compose and type a letter of application and a resume.

11.0 DEMONSTRATE A KNOWLEDGE OF INFORMATION PROCESSING CONCEPTS--The student will be able to:

11.01 List major programming languages used in business data processing.
11.02 Locate requested information on a computer printout.
11.03 Identify applications of computers in modern business.
11.04 Classify fields found within an employee payroll record.
11.05 Classify fields required on a purchase requisition.
11.06 Classify characteristics of recording transactions as either on-line, point-of-sale, or manual.
11.07 Calculate batch totals for computer processing.
11.08 Balance a payroll register.

12.0 DEVELOP LEADERSHIP SKILLS--The student will be able to:

12.01 Choose appropriate action in a situation requiring application of business ethics.
12.02 Identify basic principles of parliamentary procedure.
12.03 Greet and introduce individuals.

13.0 PERFORM CONSUMER ECONOMICS ACTIVITIES--The student will be able to:

13.01 Identify basic concepts of the American economic system.

14.0 IDENTIFY FUNCTIONS OF DATA PROCESSING--The student will be able to:

14.01 Identify computer hardware and software.
14.02 Identify generic data processing terms.
14.03 Identify the relationship between a source document and a single transaction on a unit of record.
14.04 Identify major types of careers in data processing with the duties performed and educational requirements needed.
14.05 Sequence and define the steps of a processing cycle.
14.06 Identify symbols used in flowchart application.
14.07 Identify characteristics of high-level languages.
14.08 Identify characteristics of operating systems.
14.09 Identify characteristics of sequential, indexed sequential, random, and direct files.
14.10 Identify needs for software development in business.
14.11 Identify causes of software development problems in business.
14.12 Identify the historical development of structured programming.
14.13 Identify most appropriate languages for solving business problems.
14.14 Identify high-level language program structure.
14.15 Identify high-level language elements.
14.16 Identify high-level language program contents.
14.17 Identify high-level language commands.

15.0 PERFORM DECISION-MAKING ACTIVITIES--The student will be able to:

15.01 Choose appropriate action in situations requiring application of business ethics.
15.02 Establish priority of jobs.
15.03 Select most appropriate language for solving a problem.

16.0 OPERATE DATA ENTRY EQUIPMENT--The student will be able to:

16.01 Set up workstation following correct procedures for logging on and off system.
16.02 Prepare key entry format for data entry device.
16.03 Enter and verify data from source documents.
16.04 Add, modify, delete, and correct records in a file.
16.05 Locate information in a data file.
16.06 Identify correct solutions to error messages using reference manual.

17.0 PLAN PROGRAM DESIGN--The student will be able to:

17.01 Prepare a system flowchart.
17.02 Prepare a detailed flowchart for coding a program.
17.03 Prepare a printer spacing chart.
17.04 Examine existing utility programs and subroutines for application to a job.

18.0 CODE PROGRAMS--The student will be able to:

18.01 Code a program in a high-level language for a business application program.
18.02 Utilize reference manuals for debugging in a high-level language.
18.03 Utilize sequential, indexed sequential, random, or direct files.

19.0 TEST PROGRAMS--The student will be able to:

19.01 Develop data for use in program testing.
19.02 Perform debugging activities.
19.03 Evaluate program test results.

20.0 PERFORM PROGRAM MAINTENANCE--The student will be able to:

20.01 Review modification of programs.
20.02 Update existing programs and documentation with changes.
20.03 Locate requested information, verify totals, and manually correct errors on a computer printout.

21.0 EVALUATE BUSINESS COMPUTER PROGRAMMING TASKS--The student will be able to:

21.01 Observe business computer programming in a business/industry setting or by audiovisual presentations.
21.02 Identify tasks performed by business computer programming personnel.
21.03 Compare tasks performed by computer programmers.

22.0 PERFORM ADVANCED BUSINESS COMPUTER PROGRAMMING TECHNIQUES--The student will be able to:

22.01 Write a high-level language program that incorporates control breaks.
22.02 Write a high-level language program that includes at least one table and a table lookup routine.
22.03 Write a high-level language program using any combination of sort options.
22.04 Write a high-level language program to print a newly created master file.
22.05 Write a high-level language program to call a subroutine into an existing program using the appropriate statements.

Design Criteria

The facility should provide space and learning stations to enable the instruction to meet program objectives. **Florida State Board of Education Rule 6A-2.32** specifies the size of space and occupancy design criteria that school districts or community colleges must follow in planning and designing facilities for Computer Programming programs. According to this rule, facility sizes recommended for a one-time occupancy design capacity of fifteen students are as follows:

DEDICATED SPACE
(in square feet)

	Per Student			Total (Based on 15 students)		
	Min.	Normal	Max.	Min.	Normal	Max.
Classroom	25	27	29	375	405	435
Laboratory	60	63	66	900	945	990
Material Storage				95	100	105
Required Program Space				1370	1450	1530

Classroom and laboratory areas should be designed to accommodate Computer Programming workstations and equipment. Electrical outlets should be provided in the form of permanently fixed vertical power posts to be accessible for each student workstation. A central master switch should control student workstations.

Lockable storage cabinets should be provided for the security of small electrical appliances, software, and other valuable materials.

For further information on spaces, refer to **S.B.E. 6A-2**.

Suggested Equipment and Supplies

The following list indicates *suggested* equipment and supplies and is *not* comprehensive.

Tools:
Repair kit for simple repairs
Vacuum (hand-held, designed for computers)

Equipment:
Book holders
Bulletin board
Cabinets (lockable)
Chairs (secretarial)
Chalkboards (dustless) or whiteboards with dry markers and erase cloths
Computer projection panel
Copy machine
Diskette storage boxes
Display racks (for periodicals)
Dustcovers for computers and printers
Filing cabinets (locking)
Hole punches (single and 3-hole)
Items for illustration: (abacus, magnetic tape reels, vacuum tubes, transistor boards, computer chips, hard disk platter and cases, various sizes of floppy disks, punch cards, etc.)
Lectern or podium
Microcomputers (appropriate, or multiuser computer)
Modem
Monitors and keyboards
Overhead projector and cart
Printer stands
Printers
Projection screen
Reinking machine (for printer ribbons)
Surge suppressors
Telephone with modem hookup
Television
Workstations with desks or tables

Supplies:
Antistatic spray
Board cleaner
Coding forms
Computer paper
Diskette storage boxes
Diskettes and labels
Dry markers
Flowchart worksheets
Flowcharting templates
Head-cleaning kits
Periodicals
Printer ribbons and ink
Report-spacing charts

Safety

Although no specific safety regulations have been mandated for Computer Programming programs, it is suggested that strict adherence to the general standards contained in the Florida Department of Education *Educational Facilities: Public Schools & Community Colleges* Rules of Florida State Board of Education

(Administrative Code), Ch. 6A-2 Rules be practiced (e.g., first-aid kits in classrooms, adequate fire extinguishers, fire evacuation plan, etc.).

In addition, the following procedures have been found useful in computer labs at various high schools, vocational-technical centers, and community colleges throughout the State of Florida.

Safety procedures and fire drill instructions should be posted and reviewed regularly with students.
Before using hardware and software, students should be thoroughly instructed on its use and care.
Instructor or supervisor must be present for students to work in the computer lab.
Students should use data disks in second drive; major programs remain intact and write-protected in the first drive.
All computer and printer cords should be contained in channels, or under false floor, or tie-downs.
Cords for AV equipment should be covered when in use.
All equipment should have surge protectors.
Labs should have security systems.
Labs should have tiled floors or antistatic carpet.
Equipment should be independently wired; when one machine goes down, others will not be affected.
Each set of machines should be connected to circuit breakers.
No food or liquids should be allowed in the computer lab.
Cover sharp edges with tape or lucite corner covers.

PROGRAM IMPLEMENTATION

Student Learning Guide

A sample student learning guide is provided in the Appendix as an example for you to use when developing or adapting a set of learning guides or modules. This sample guide presents the major components of a competency-based student learning guide. For further information see the *Florida Vocational Program Implementation Guide*.

Student Organization Participation

The vocational student organizations associated with the Computer Programming program are Future Business Leaders of America for secondary students and Phi Beta Lambda for postsecondary students. These organizations are cocurricular and are considered an integral part of the instructional program.

Refer to the *Florida Vocational Program Implementation Guide* for more information.

PROFESSIONAL CONSIDERATIONS

Teacher Certification

Listed below are the certification coverages included in the current Course Code Directory for Computer Programming:

CERTIFICATION COVERAGE:	10-12; 30, 31	BUS ED @4 1 2 TEACH CBE @7 TEC ELEC @7 BOOKKEEPING @4 @7	VOC @7 BUS DP @7 ELECT DP @7
	30, 31	BUS ED @4 1 2 TEACH CBE @7 TEC ELEC @7 BOOKKEEPING @4 @7	VOC @7 BUS DP 7 ELECT DP @7

Professional Organizations and Support Services

American Vocational Association-Business Education
1410 King Street
Alexandria, VA 22314

American Vocational Education Personnel Development Association (AVEPDA)
Box 6446
Finchburg State College
Finchburg, MA 01420

American Vocational Education Research Association (AVERA)
305 Rolfs Hall
University of Florida
Gainesville, FL 32606

Association for Computing Machinery
Special Interest Group on Computer Science Education
11 West 42nd Street
New York, NY 10036

Business-Higher Education Forum
One Dupont Circle, Suite 800
Washington, DC 20036

Delta Pi Epsilon
Gustavus Adolphus College
St. Peter, MN 56082

Florida Association of Computer Educators
Alice Ray-Overstreet
5616 Stratford Lane
Lakeland, FL 33813

Form a Student Computer Club (FACES)
Faye Ward
Mosley High School
3418 North Palo Alto
Panama City, FL 32405

Foundation for Student Communication (Business)
305 Aaron Burr Hall
Princeton University, NJ 08540

International Association for Computing in Education
c/o William J. Russell
American Education Research Association
1230 17th Street, NW
Washington, DC 20036

International Society for Business Education
1914 Association Drive
Reston, VA 22901

Junior Achievement (Business)
45 Clubhouse Drive
Colorado Springs, CO 80906

National Association for Business Teachers
1914 Association Drive
Reston, VA 22091

National Business Education Association (NBEA)
1914 Association Drive
Reston, VA 22091

INSTRUCTIONAL RESOURCES

Listed on the following pages are sample material sources that are available for Computer Programming. Additional resources may be available from other sources including professional and trade organizations. You are encouraged to seek catalogs from these firms so that you become familiar with materials available.

Sources of Print and Audiovisual Materials and Software

	Print	Audiovisual	Software
Addison-Wesley Publishing Company 1 Jacob Way Reading, MA 01867	X	X	X
Aldus Corporation 411 First Avenue South Seattle, WA 98104	--	--	X
Anaheim Publishing Company (see Wadsworth, Inc.)			
Arco Publishing, Inc. Division of Simon & Schuster 1 Gulf and Western Plaza New York, NY 10023	X	--	--
Beekman Publishers, Inc. P.O. Box 888 Woodstock, NY 12498	X	--	--
Bergwall Productions, Inc. P.O. Box 238 Garden City, NY 11530-0238	--	X	--
Bobbs-Merrill Company 866 Third Avenue New York, NY 10022	X	X	--
Borland International 4585 Scotts Valley Drive Scotts Valley, CA 95066	--	--	X
Brodart Company 500 Arch Street Williamsport, PA 17705	X	--	--

	Print	Audiovisual	Software
Business Education Services 10200 Jefferson Boulevard, Room 4 P.O. Box 802 Culver City, CA 90232-082	X	X	X
ButtonWare Inc. P.O. Box 5786 Bellevue, WA 98006	--	--	X
Camelot Publishing Company P.O. Box 1357 Ormond Beach, FL 32075-1357 (904) 672-5672	X	X	X
Career Aids 20417 Nordhoff Street Chatsworth, CA 91311	X	X	X
CompuSoft Publishing Company 17725 Rancho de la Angel Ramona, CA 92065 (619) 789-7365	X	--	--
Delmar Publishing, Inc. 2 Computer Drive, West Albany, NY 12205	X	--	--
Dictation Disc Company 14 East 38th Street New York, NY 10016 (212) 683-9028	X	X	--
Dryden Publishers A Division of Holt, Rinehart & Winston 908 N. Elm St., 101 Hinsdale, IL 60521	X	--	--
Educational Development and Training Center East Texas State University Commerce, TX 75428	X	X	--
Franklin, Beedle and Associates Publishers 4521 Campus Drive, 327 Irvine, CA 92715-9877	X	--	X
Franklin McNeal, Ltd. 1175-1 Fleming Street P.O. Box 2335 Smyrna, GA 30081-2335	--	--	X

	Print	Audiovisual	Software
Glencoe Publishing Company 15319 Chatsworth Street Mission Hills, CA 91345-9509	X	X	X
Harcourt Brace Jovanovich, Inc. 1250 Sixth Avenue San Diego, CA 92101	X	X	--
Houghton Mifflin Company One Beacon Street Boston, MA 02108	X	X	X
Howard W. Sams and Company A Division of Macmillan, Inc. 4300 West 62nd Street Indianapolis, IN 46268	X	--	--
Irwin, Richard D., Inc. 1818 Ridge Road Homewood, IL 60430	X	X	X
Little, Brown, and Company Division of Time, Inc. 34 Beacon Street Boston, MA 02108	X	--	--
Macmillan Publishing Co., Inc. 866 Third Avenue New York, NY 10022	X	X	X
McGraw-Hill Publishing Company 1221 Avenue of the Americas New York, NY 10020	X	X	X
McGraw-Hill Publishing Company Gregg Division 13955 Manchester Road Manchester, MO 63011	X	X	X
National Learning Corporation 212 Michael Drive Syosset, NY 11791	X	--	--
Oklahoma State Department of Vocational and Technical Education 1500 West Seventh Avenue Stillwater, OK 74074-4364	X	X	X

	Print	Audiovisual	Software
Prentice-Hall Division of Simon & Schuster Route 9 West Englewood Cliffs, NJ 07632	X	X	X
Putnam Publishing Group 200 Madison Avenue New York, NY 10016	X	--	--
RMI Media Productions 120 West 72nd Street Kansas City, MO 64114	--	X	--
South-Western Publishing Company 5101 Madison Road Cincinnati, OH 45227	X	X	X
SRA/Pergamon Business and Technical Division 1999 Shepard Road Saint Paul, MN 55116	X	X	X
Tandy Corporation 1600 One Tandy Center Ft. Worth, TX 76102	--	--	X
Wadsworth, Inc. 10 Davis Drive Belmont, CA 94002 Attn: Sally Uchizono	X	--	X
Walch, J. Weston, Publisher P.O. Box 658 Portland, ME 04104-0658	X	X	X
West Publishing Company 50 W. Kellog Boulevard P.O. Box 64526 St. Paul, MN 55164-1003	X	--	--
Wiley, John & Sons, Inc. 605 Third Avenue New York, NY 10158-0012	X	X	X

	Print	Audiovisual	Software
Wm. C. Brown Publishers 2460 Kerper Boulevard P.O. Box 539 Dubuque, IA 52001	X	--	X
WordPerfect Corporation 1555 Technology Way Orem, UT 84057	--	--	X

Teacher-Recommended Materials

BOOKS

Author	Title	Publisher	Year
Baumann, Susan K.	*Understanding Pascal: Turbo Version*	West	1990
Baumann, Susan K.	*Understanding Pascal: Turbo Version* (Teacher's Manual and Test Bank)	West	1990
Bohl, Marilyn	*Guide for Programmers*	Prentice-Hall	1978
Bradley, Julia C.	*Quick BASIC Using Modular Structure*	Wm. C. Brown	1989
Bux, William E.	*Data Entry Activities for the Microcomputer*	South-Western	1988
Clark, James F.; Drum, William O.	*Structured Basic* (2nd Edition)	South-Western	1989
Close, Kenneth S.	*Electronic Spreadsheet Applications in Practice*	South-Western	1988

Author	Title	Publisher	Year
Coburn, Edward J.	*Advanced BASIC --Structured Programming for Microcomputers*	Delmar	1986
Coffin, Stephen	*Unix: The Complete Reference*	Osborne McGraw-Hill	1989
Dologite, Dorothy G.; Mockler, Robert J.	*Using Computers* (2nd Edition)	Prentice-Hall	1989
Drum, William O.	*Database Applications*	South-Western	1990
Eisch, Mary Alice	*WordPerfect 5.0, Tutorial and Applications, IBM Version*	South-Western	1990
Essick, Edward L.	*Principles of Business Data Processing* (5th Edition)	SRA	1986
Gillay, Carolyn Z.	*PC/MS DOS Fundamentals*	Franklin, Beedle	1988
Gilbert, Harry M.; Larky, Arthur	*Practical Pascal*	South-Western	1984
Grauer, Robert T.; Barber, Maryann M.	*Database Management through dBase*	McGraw-Hill	1988
Groneman, Nancy; Owen, Susan	*Applications Using the Personal Computer*	South-Western	1988
Lafore, Robert	*The Waite Group's Microsoft C: Programming for the PC*	Howard W. Sams	1989

Author	Title	Publisher	Year
Lien, David A.	*MS-DOS Volume 2: Advanced Applications*	Compusoft	1986
Mandell, Steven L.	*Computers and Information Processing* (5th Edition)	West	1985
Mandell, Steven L.	*Computers and Information Processing* (5th Edition) (Instructor's Manual and Test Bank)	West	1985
Mandell, Steven L.	*Introduction to Computers Using the TRS-80*	West	1985
Mandell, Steven L.; Mandell, Colleen J.	*Understanding Pascal: A Problem Solving Approach*	West	1985
Mandell, Steven L.; Mandell, Colleen J.	*Understanding Pascal: A Problem Solving Approach* (Teacher's Manual and Test Bank)	West	1985
Murach, Mike	*Business Data Processing with COBOL* (2nd Edition)	SRA	1977
Murach, Mike	*Student Workbook-- Business Data Processing and Computer Programming*	SRA	1977
Nickerson, Robert C.	*Fundamentals of Structured COBAL* (2nd Edition)	Little, Brown	1987

Author	Title	Publisher	Year
O'Brien, James A.	*Information Systems in Business Management* (5th Edition)	Irwin	1988
O'Leary, Timothy J.; Williams, Brian K.; and O'Leary, Linda I.	*Microcomputing Labs*	McGraw-Hill	1989
O'Leary, Timothy J.	*The Student Edition of Lotus 1-2-3*	Addison Wesley	1989
Pace, Phillip; Pace, Larry	*Logic Tools for Programming*	Delmar	1989
Philippakis, Andreas S.; Kazimer, Leonard J.	*Advanced COBOL* (2nd Edition)	McGraw-Hill	1978
Philippakis, Andreas S.; Kazimer, Leonard J.	*Information Systems through COBOL* (2nd Edition)	McGraw-Hill	1978
Presley, Bruce; Corica, Tim	*A Guide to Programming in Turbo Pascal*	Delmar	1986
Price, Wilson T.; Olson, Jack L.	*Elements of COBOL Programming*	Dryden	1977
Ross, Steven C.; Lund, Patsy H.	*Understanding and Using Application Software: Volume 3*	West	1988
Ruby, Ralph Jr., Roberts, Don	*Micro 4 Programs in Basic*	J. Weston Walch	1983
Rutkosky, Nita Hewitt	*A Mastery Approach to WordPerfect Version 5.0*	SRA	1988

Author	Title	Publisher	Year
Schnake, Marilyn A.,	*The World of Computers and Data Processing*	West	1985
Settle, Mickey; Boillot, Michel	*Turbo Pascal Is* (A Student Computer Lab Manual to Accompany *Turbo Pascal: Programming and Problem Solving*)	West	1988
Settle, Mickey; Boillot, Michel	*Turbo Pascal: Owner's Handbook*	Borland International	1987
Settle, Mickey; Boillot, Michel	*Turbo Pascal: Programming and Problem Solving*	West	1988
Settle, Mickey; Boillot, Michel	*Turbo Pascal: Programming and Problem Solving* (Instructor's Solutions Manual with Test Bank)	West	1988
Shelly, Gary B.; Cashman, Thomas J.	*Computer Programming RPG II*	Anaheim	1976
Shelly, Gary B.; Cashman, Thomas J.	*Introduction to Basic Programming*	Anaheim	1982
Shelly, Gary B.; Cashman, Thomas J.	*Introduction to Computer Programming: ANSI Cobal*	Anaheim	1973
Shelly, Gary B.; Cashman, Thomas J.	*Introduction to Computer Programming: Structured Cobal*	Anaheim	1982
Shelly, Gary B.; Cashman, Thomas J.	*Introduction to Computers and Data Processing*	Anaheim	1980

Spencer, Donald D.	*Computer Dictionary* (2nd Edition)	Camelot	1979
Steinbach	*Programming Problems*	Glencoe	1969

AUDIOVISUAL

Title	Source	Format	Year
Introduction to Automated Data Processing	South-Western	Filmstrips	1983

SOFTWARE

Title	Source	Format	Year
Data Entry Activities for the Microcomputer	South-Western	TRS-80, Apple, IBM	1988
Lotus 1-2-3 (Student Edition)	Addison-Wesley	IBM, Apple, Tandy	1988
PageMaker	The Aldus Corporation	IBM	1987
PC-CALC and *Version 2*	ButtonWare, Inc.	IBM, Tandy	no date (released 1989)
PC-File Version 5	ButtonWare, Inc.	IBM, Tandy	no date (released 1990)
Turbo Pascal 5.5	Borland International	IBM	no date
WordPerfect 5.2	WordPerfect Corporation	IBM, Tandy, Apple	1989
		Commodore	1988

Periodicals

Classroom Computer Learning
2451 E. River Road
Dayton, OH 45439

Electronic Learning
Scholastic Inc.
P.O. Box 2040
Mahopac, NY 10541-9963

Info World
P.O. Box 5994
Pasadena, CA 91117

Modern Office Technology
1100 Superior Avenue
Cleveland, OH 44114

PCM
Falsoft, INC.
P.O. Box 385
Prospect, KY 40059

PC Resource
IDG Communications/Peterborough, Inc.
80 Elm Street
Peterborough, NH 03458

Teaching and Computers
Scholastic Inc.
730 Broadway
New York, NY 10003-9538

T.H.E. Journal
P.O. Box 15126
Santa Ana, CA 92705-0126

DATA BASES

DOE Bulletin Board--Primarily for news items and short bulletins used by DOE
Florida CHOICES--Computerized career and information system
Florida Occupational Information System--Occupational supply and demand information is available on 800 occupations
FIRNCOM User's Guide
Library User Information Service--Computerized card catalog service that provides three and a half million records of information from all universities in the state of Florida

Microcomputer Software Evaluation--Courseware data base that provides evaluation of 1600 pieces of instructional software
Southwest Regional Data Center--Florida International University, Miami, FL 33199

Individual broadcasts of *Computer Chronicles* can be taped off the air and used for up to ten days by classroom teachers. Check with the AV people at your school.

FEIS Services

FLORIDA EDUCATIONAL INFORMATION SERVICE
2003 Apalachee Parkway
Tallahassee, FL 32301
(904) 487-2054

If you need (1) information about copyright; (2) a list of instructors teaching Computer Programming programs in Florida; (3) journal articles or project reports on specific topics; (4) curriculum and instructional materials; (5) information on current trends, issues, and research, please contact the Florida Educational Information Service (FEIS), Center for Instructional Development and Services, College of Education, Florida State University, 2003 Apalachee Parkway, Tallahassee, Florida 32301, (904) 487-2054. FEIS will tailor its service to meet your needs on information concerning resource materials.

APPENDIX

Sample Student Learning Guide
for
Computer Programming

09.0 DEVELOP APPROPRIATE GROOMING HABITS

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Read Resource No. 1 to become familiar with aspects of good grooming. 2. Evaluate your knowledge by completing the Self-Check.	1. Instruction Sheet enclosed. Looking Good 2. Self-Check enclosed.

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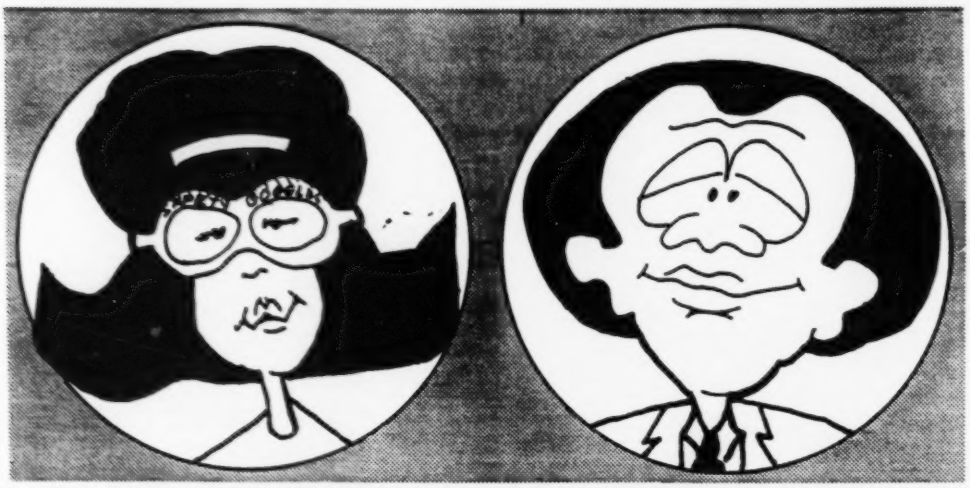
Looking Good

"What I wear is my own business!" That may be true in your personal life, but on the job, it's your employer's business, too. Workers who think that clothes, grooming, personal habits, and general health can't help - or hurt - when trying to get a good job are only kidding themselves. In fact, some employers rate their workers' appearance and grooming habits on employee evaluation forms, and use these evaluations in deciding who will get a raise or promotion. Grooming and dressing are important for two reasons:

1. for safety (they want to protect their employees from injury).
2. for appearance (they want their employees to look good).

SAFETY **APPEARANCE**



"Why should my appearance matter? I get my work done, and I do a good job!" Employers know that customers and co-workers expect to deal with people who are clean, healthy looking, and neatly dressed. They also know that people sometimes judge a company by the appearance of its workers. For these reasons, most employers insist that their workers have good grooming habits.

Personal appearance can help a worker's chances for promotion. Things like proper weight, good posture, and pleasant manners can be very important, especially in businesses where the employee must work with the public. Sometimes nervous personal habits (like smoking, chewing gum, cracking knuckles, or biting fingernails) can keep workers from jobs where they must represent the company to the public.

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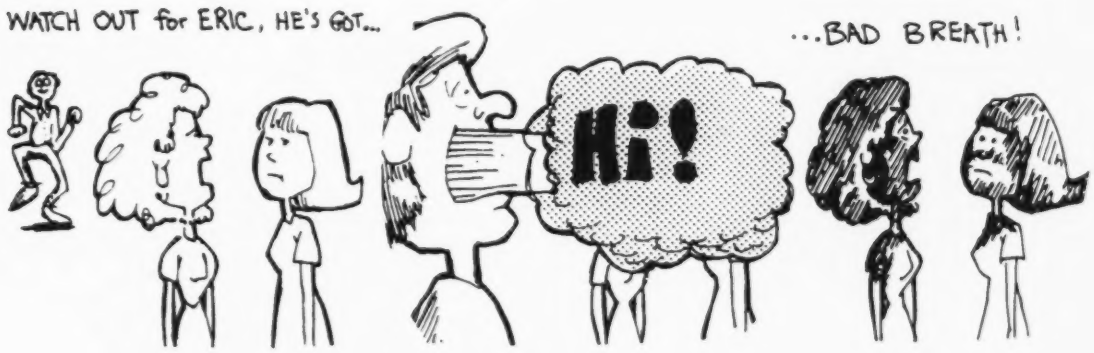
The most important rule in good grooming is cleanliness: hair, clothes, body, fingernails, breath. But there are other grooming rules a new worker needs to think about, such as proper dress. Some companies provide or require uniforms for their employees. Others have dress codes. These are rules or guidelines of what to wear, including clothes, jewelry, and hairstyles. For example, many employers prefer female workers to wear very little makeup and jewelry to work. They may ask their male employees to be clean shaven or to wear only short, well-trimmed beards or moustaches. Dress codes like these are chosen to improve the appearance of employees.



Employers also choose dress codes or uniforms for their workers' safety. Steel-toed shoes, protective eye goggles, and rubber gloves are safety wear required on some jobs. For people who work with machines, long hair can be a safety hazard. Dress codes that require short hair (or require hair to be pulled back) are designed to prevent accidents.

Not all dress codes are written down. Some are just understood. For example, dirty hair and wrinkled clothes with missing buttons are never proper dress. Heavily scented colognes and after-shaves are better worn after hours and not to work. For some kinds of work, blue jeans are fine, but they are not suited for all jobs. In the same way, there are jobs where a business suit would be out of place.

The general dress code for any job is to dress neatly and appropriately. This means wearing the clothes, jewelry, and hairstyle suited for the kind of work you do.

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SELF-CHECK: KNOWLEDGE OUTCOME

RVTC

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. Two reasons why grooming and dress are important are safety and appearance.
2. The most important rule in good grooming is cleanliness.
3. Dress codes are guidelines of what employees should not wear.
4. Dress codes are enforced only because of safety hazards occurring.
5. The general dress code for any job is to dress neatly and appropriately.

1. T
2. T
3. F
4. F
5. T

Now check your answers with the Answer Key.

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State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

Division of Vocational, Adult, and Community Education

DVACE/06/90/700 12345789/90 BE 147 BK 90

CAREER MERIT ACHIEVEMENT PLAN (CAREER MAP)

COMPUTER PROGRAMMING

(0507.030000)

STUDENT'S NAME

State of Florida

An affirmative action/equal opportunity employer

DEPARTMENT OF EDUCATION
Betty Castor, Commissioner

DIVISION OF VOCATIONAL, ADULT, AND COMMUNITY EDUCATION
Robert S. Howell, Director

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Florida Education Center
Tallahassee, FL 32399
(904) 488-0484

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THIS MERIT ACHIEVEMENT PLAN RECORDS THE ACHIEVEMENTS OF:

Student's Name _____

Student's ID Number _____

Student's Address _____

_____

Instructor's Name _____ **Initials** _____

School _____

_____

Date Started _____

PRIMARY JOB TITLE FOR THIS INSTRUCTIONAL PROGRAM

- Business Programmer (020.162-014)

ACKNOWLEDGMENTS

The Division of Vocational, Adult, and Community Education expresses appreciation to the following computer programming professionals from across the state who reviewed the standards included in this MAP.

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Linda Smith, David G. Erwin Area Vocational-Technical Center, Tampa

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OVERVIEW

This Career MAP includes the competencies required for entry into the work force as a computer programmer. Business and industry representatives have recommended that students in this field master these competencies in order to become employable. Local education agencies (LEAs) may adapt these competencies to meet their work-force needs.

Purposes of the MAP

The purposes of the MAP are to display the student performance standards (SPSs) required by the LEA and to document the level of achievement on SPSs that the student demonstrates.

How to Use the MAP

Administrator and Instructor. The administrator and instructor can use Career MAPs in curriculum planning, program updating and improvement, and teacher recruitment, selection, and updating. If the LEA changes or adds SPSs, the revised or additional SPSs should be included in the blank boxes that appear within each intended outcome or at the end of this MAP.

Instructor. The instructor can use Career MAPs to keep track of student progress on SPSs. By periodically reviewing the ratings on standards, the instructor can identify a student's strengths and weaknesses and on that basis identify the skills for which the student needs remedial instruction or advanced training. MAPs can also be useful in student counseling and evaluation.

Co-op Instructor/Employer. The employer who sponsors a co-op program should use the Career MAP for keeping a record of the student's performance on appropriate standards. The MAPs will also help the co-op instructor/employer in counseling and evaluating the student.

Student. The student may use the MAP to show potential employers the performance standards he or she has mastered. In order to present a complete record, the student should encourage the instructor/co-op employer to rate his or her level of achievement on all the appropriate SPSs and to fill in the verification form and the business cooperative on-the-job experiences page in the back of this MAP.

Employer. The MAP shows an employer the SPSs mastered by the student (a prospective employee) and the proficiency level achieved on each one. This information can help the employer make decisions about hiring, job assignments, and job-training needs.

Rating Student Performance

Performance Competencies. Ratings on SPSs should be based upon business/industrial performance standards. The evaluator observes and evaluates student performance as he or she would in the role of the employer or supervisor.

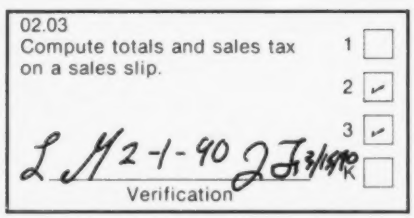
For each skill listed, the learner receives a rating of 1, 2, or 3. Each rating indicates a particular level of achievement:

1 = Learner demonstrates knowledge and understanding of this SPS, but is not yet able to apply that knowledge or understanding.

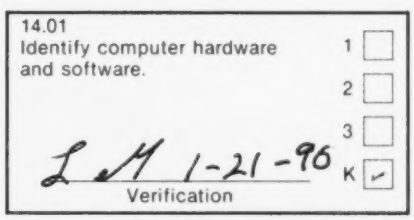
2 = Learner performs this SPS satisfactorily with only periodic supervision.

3 = Learner performs this SPS satisfactorily without supervision.

Whenever a performance standard is demonstrated, the instructor checks the appropriate rating box (1, 2, or 3) and initials and dates the verification line. If the student later demonstrates a higher level of achievement on a performance competency, the instructor checks the higher level and then enters his or her initials and the new date on the verification line, as shown in the following example:



Knowledge Competencies. For each SPS that is a knowledge competency only, with no manipulative skill involved, only one level of achievement is possible. If the student masters the competency, he or she receives a check in the bottom box ("K"), as shown below:



NOTE: An SPS without a checked rating indicates that the learner has not mastered the standard from lack of ability, time, opportunity, or need (the student's area of specialization may not have required it).

COMPUTER PROGRAMMING

01.0 PERFORM TELEPHONE ACTIVITIES.

01.01 Identify telephone services and types of calls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	01.02 Locate telephone numbers and addresses. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

02.0 PERFORM MATH COMPUTATIONS.

02.01 Solve addition, subtraction, multiplication, and division problems manually. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.02 Complete an invoice. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.03 Compute totals and sales tax on a sales slip. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
02.04 Solve addition, subtraction, multiplication, and division problems using a ten-key calculator or numeric pad. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.05 Compute discounts. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

03.0 PERFORM KEYBOARDING/TYPEWRITING ACTIVITIES.

03.01 Demonstrate keyboarding techniques. 1 2 3 K _____ Verification	03.02 Identify operative parts of keyboarding equipment. 1 2 3 K _____ Verification	03.03 Identify formatting principles. 1 2 3 K _____ Verification
03.04 Demonstrate speed and accuracy in typing straight-copy material. 1 2 3 K _____ Verification	03.05 Type business letters and envelopes. 1 2 3 K _____ Verification	03.06 Type interoffice memoranda. 1 2 3 K _____ Verification
03.07 Type tabulated information. 1 2 3 K _____ Verification	03.08 Type different sizes of cards. 1 2 3 K _____ Verification	1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

04.0 PERFORM FILING ACTIVITIES.

04.01 Index, code, sort, and file materials alphabetically. 1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

COMPUTER PROGRAMMING

05.0 PERFORM BUSINESS RECORDS ACTIVITIES.

05.01 Prepare checks and stubs. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.02 Endorse checks using special endorsement. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.03 Prepare a deposit slip and adjust checkbook. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
05.04 Prepare bank reconciliations. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.05 Enter data into an accounts payable system. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.06 Enter data into an accounts receivable system. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
05.07 Enter data into a cash payments system. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.08 Enter data into a cash receipts system. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	05.09 Enter data into a payroll system. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification

06.0 PERFORM MAIL-HANDLING ACTIVITIES.

06.01 Classify mail. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	06.02 Locate ZIP codes. 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification

COMPUTER PROGRAMMING

07.0 PERFORM COMMUNICATION ACTIVITIES.

07.01 Locate and record information retrieved from written sources. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.02 Spell and define words, including business terminology. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.03 Follow oral and written instructions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
07.04 Compose and keyboard a letter of application. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.05 Compose and keyboard a resume. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

08.0 DEVELOP HUMAN RELATIONS SKILLS.

08.01 Demonstrate appropriate work habits. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	08.02 Identify traits that promote good human relations and increase job performance. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

COMPUTER PROGRAMMING

09.0 DEVELOP APPROPRIATE GROOMING HABITS.

09.01
Identify appropriate attire and grooming for a business office.
1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

10.0 PERFORM JOB APPLICATION ACTIVITIES.

10.01
Complete employment forms.
1 ☐
2 ☐
3 ☐
K ☐
Verification

10.02
Classify behaviors considered to be appropriate or inappropriate in a job interview situation.
1 ☐
2 ☐
3 ☐
K ☐
Verification

10.03
Compose and type a letter of application and a resume.
1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

1 ☐
2 ☐
3 ☐
K ☐
Verification

11.0 DEMONSTRATE A KNOWLEDGE OF INFORMATION PROCESSING CONCEPTS.

11.01
List major programming languages used in business data processing.
1 ☐
2 ☐
3 ☐
K ☐
Verification

11.02
Locate requested information on a computer printout.
1 ☐
2 ☐
3 ☐
K ☐
Verification

11.03
Identify applications of computers in modern business.
1 ☐
2 ☐
3 ☐
K ☐
Verification

11.04 Classify fields found within an employee payroll record. 1 2 3 K _____ Verification	11.05 Classify fields required on a purchase requisition. 1 2 3 K _____ Verification	11.06 Classify characteristics of recording transactions as either on-line, point-of-sale, or manual. 1 2 3 K _____ Verification
11.07 Calculate batch totals for computer processing. 1 2 3 K _____ Verification	11.08 Balance a payroll register. 1 2 3 K _____ Verification	1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

12.0 DEVELOP LEADERSHIP SKILLS.

12.01 Choose appropriate action in a situation requiring application of business ethics. 1 2 3 K _____ Verification	12.02 Identify basic principles of parliamentary procedure. 1 2 3 K _____ Verification	12.03 Greet and introduce individuals. 1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

13.0 PERFORM CONSUMER ECONOMICS ACTIVITIES.

13.01 Identify basic concepts of the American economic system. 1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

COMPUTER PROGRAMMING

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

14.0 IDENTIFY FUNCTIONS OF DATA PROCESSING.

14.01 Identify computer hardware and software. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.02 Identify generic data processing terms. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.03 Identify the relationship between a source document and a single transaction on a unit of record. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.04 Identify major types of careers in data processing with the duties performed and educational requirements needed. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.05 Sequence and define the steps of a processing cycle. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.06 Identify symbols used in flowchart application. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.07 Identify characteristics of high-level languages. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.08 Identify characteristics of operating systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.09 Identify characteristics of sequential, indexed sequential, random, and direct files. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.10 Identify needs for software development in business. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.11 Identify causes of software development problems in business. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.12 Identify the historical development of structured programming. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.13 Identify most appropriate languages for solving business problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.14 Identify high-level language program structure. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.15 Identify high-level language elements. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.16 Identify high-level language program contents. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.17 Identify high-level language commands. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

COMPUTER PROGRAMMING

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

15.0 PERFORM DECISION-MAKING ACTIVITIES.

15.01 Choose appropriate action in situations requiring application of business ethics. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.02 Establish priority of jobs. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.03 Select most appropriate language for solving a problem. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

16.0 OPERATE DATA ENTRY EQUIPMENT.

16.01 Set up workstation following correct procedures for logging on and off system. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.02 Prepare key entry format for data entry device. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.03 Enter and verify data from source documents. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
16.04 Add, modify, delete, and correct records in a file. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.05 Locate information in a data file. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.06 Identify correct solutions to error messages using reference manual. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

COMPUTER PROGRAMMING

17.0 PLAN PROGRAM DESIGN.

17.01 Prepare a system flowchart. 1 2 3 K _____ Verification	17.02 Prepare a detailed flowchart for coding a program. 1 2 3 K _____ Verification	17.03 Prepare a printer spacing chart. 1 2 3 K _____ Verification
17.04 Examine existing utility programs and subroutines for application to a job. 1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

18.0 CODE PROGRAMS.

18.01 Code a program in a high-level language for a business application program. 1 2 3 K _____ Verification	18.02 Utilize reference manuals for debugging in a high-level language. 1 2 3 K _____ Verification	18.03 Utilize sequential, indexed sequential, random, or direct files. 1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification
1 2 3 K _____ Verification	1 2 3 K _____ Verification	1 2 3 K _____ Verification

19.0 TEST PROGRAMS.

19.01 Develop data for use in program testing. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	19.02 Perform debugging activities. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	19.03 Evaluate program test results. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

20.0 PERFORM PROGRAM MAINTENANCE.

20.01 Review modification of programs. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	20.02 Update existing programs and documentation with changes. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	20.03 Locate requested information, verify totals, and manually correct errors on a computer printout. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

21.0 EVALUATE BUSINESS COMPUTER PROGRAMMING TASKS.

21.01 Observe business computer programming in a business/industry setting or by audiovisual presentations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	21.02 Identify tasks performed by business computer programming personnel. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	21.03 Compare tasks performed by computer programmers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

22.0 PERFORM ADVANCED BUSINESS COMPUTER PROGRAMMING TECHNIQUES.

22.01 Write a high-level language program that incorporates control breaks. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	22.02 Write a high-level language program that includes at least one table and a table lookup routine. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	22.03 Write a high-level language program using any combination of sort options. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
22.04 Write a high-level language program to print a newly created master file. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	22.05 Write a high-level language program to call a subroutine into an existing program using the appropriate statements. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

COMPUTER PROGRAMMING

COOPERATIVE WORK EXPERIENCE COMPETENCIES

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

COMPUTER PROGRAMMING

VERIFICATION

Each instructor who rates this student on competencies in this MAP should fill in one of the boxes below.

Initials _____ Signature _____

Title _____

School Name _____

School Address _____

Initials _____ Signature _____

Title _____

School Name _____

School Address _____

Initials _____ Signature _____

Title _____

School Name _____

School Address _____

BUSINESS COOPERATIVE ON-THE-JOB EXPERIENCES

In addition to classroom training and laboratory performance identified on the Career MAP, this student has participated in cooperative on-the-job experiences with the following employers, as shown below.

Dates _____ Employer _____

Employer's Address _____

_____

Supervisor _____

Supervisor's Title _____

Dates _____ Employer _____

Employer's Address _____

_____

Supervisor _____

Supervisor's Title _____

Dates _____ Employer _____

Employer's Address _____

_____

Supervisor _____

Supervisor's Title _____

NOTES

This section of the MAP is provided for the instructor, employer, or student to list additional qualifying statements or other pertinent information. All comments should be initialed for verification.

DVACE 06/90/6700 123456789/90 BE 149 BK 90